

**MONTHLY REPORT**

16 November - 15 December 1955

**RESEARCH AND DEVELOPMENT BRANCH  
ENGINEERING DIVISION**

**RESEARCH AND DEVELOPMENT LABORATORY**

**1. PROJECTS AND ACTIVITIES**

**2001 - MECHANICAL LABORATORY PROJECTS**

Activity in the mechanical laboratory has been directed entirely to fabrication and machine work on the following projects:

- a. AS-2 Printer and Amplifier
- b. Repackaging Raytheon IR Sets
- c. Transistorized Converter, CV-1
- d. Miniature Audio Oscillator - Research on Veeder-Root Counter application.

**2003 - LABORATORY OVERHEAD PROJECTS**

Equipment requirements for measurements of power, impedance, and frequency through 18 kmc have been determined. After a survey of availability by the Office of Logistics the equipment was ordered with a promised delivery date of approximately ten weeks from date of order. Planning has also been initiated for an Antenna Pattern Range at the Laboratory.

**2004 - COMMERCIAL EQUIPMENT EVALUATION**

**Antenna Matching Transformer, TR-047**

Investigations have been made to determine the advisability of using the TR-047 as a replacement for rhombic transformers for receiving, and the adaptability of the unit as a matching device between various balanced lines of 300 to 600 ohms impedance and unbalanced output of an RT-1B/URT-11 transmitters at full power output and various standing wave ratios with the operating frequency above 20 megacycles.

The results of the investigations indicate that for receiving, the insertion loss varied between 2-6 db in the 20-30 mc region. This may be detrimental for weak signal operation. However, between 2-20 mc the transformer should be highly efficient as a matching device. Use of the TR-047 with the URT-11 transmitter resulted in greater power and lower standing wave ratio, and the degree of improvement increased with operating frequency.

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2005 - FOREIGN EQUIPMENT EVALUATION

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a. [REDACTED] Receiver

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The [REDACTED] receiver and power supply are contained in two miniaturized cases capable of fitting into the pocket of a coat. The tests were conducted to determine the operational characteristics and suitability of the receiver for reception in the frequency range of 0.5 to 18 megacycles.

The results of tests conducted upon the [REDACTED] show that within limitations of size and weight, the receiver performed satisfactorily. High oscillator radiation, low sensitivity and low IF and image rejection ratios are examples of the design limitations. Miniaturization and compact arrangement of the components make servicing of the receiver difficult.

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b. [REDACTED] Broadcast Receiver

The object of this investigation was to determine the quality of construction and by operation compare it to receivers of similar construction.

The receiver operates in the frequency ranges of 550 kc to 1.6 mc and from 6 to 16 mc. The results of the investigation indicated the receiver to be constructed of low quality components and to be of poor construction. The operation was mediocre when compared to receivers of similar construction.

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2037 - [REDACTED] COMMUNICATIONS SYSTEM [REDACTED]

Reworked coders were installed in the field units for compatibility tests with the [REDACTED] Base Station. Tests were conducted on [REDACTED] channels 1 and 2. Channel 1 reception was satisfactory, but reception on channel 2 failed because of an operational error. Use of the ARCS Recorder rack with the [REDACTED] Receiver rack was not acceptable because of frequent false recognitions. However, different methods of feeding the recognition voltage to the [REDACTED] Recorder and the ARCS Recorder are responsible and a minor redesign of the recognition output circuit to the ARCS Recorder is required to make the thresholds of recognition compatible.

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2045 - AGENT AUTOMATIC SYSTEM, AS-2

Engineering models of the AR-2 printer and amplifier, and power supplies have been completed and satisfactorily field tested between the Laboratory and [REDACTED]. Drawings have been completed and production of ten prototypes has been initiated at the Laboratory. Simultaneously, the miniaturization and transistorization of the AR-2 printer and amplifier will proceed as a part of the agent duplex system. See attached Trip Report.

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2070 - INFRA-RED COMMUNICATION DEVICES

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The Laboratory is repackaging seven of the [REDACTED] sets to effect a substantial reduction in size.

2089 - HIGH SPEED POINT-TO-POINT COMMUNICATION SYSTEM [REDACTED]

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The [REDACTED] system was tested operationally between a transmitting site in [REDACTED] and the receiving site at [REDACTED]. Successful communications were initiated and maintained on all frequencies indicated by propagation predictions to be favorable for the path. See attached Trip Report.

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Test data is being tabulated and will be distributed in report form.

2099 - RS-13 [REDACTED] COMMUNICATIONS SYSTEM

The feasibility of eliminating the space frequency to effect on-off keying while retaining the high speed keying is being investigated. Initial efforts show some promising results.

2502 - MULTICOUPLER INVESTIGATION

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The details for the life tests on the 6AR6 tubes of the [REDACTED] Model 1080 Multicoupler have been worked out and tests have begun.

Sixteen additional multicoupler filter units have been requested by field activities. Specifications covering the construction of the filter units are being assembled for use in external procurement.

2506 - MODIFIED DISCONE ANTENNA, ELINT

The remaining modified Discone Antenna has been tested. Results will be reported during the coming period.

2508 - PHOTO-ETCHED ANTENNAS

The investigation of the characteristics of etched antennas continues. A review of antenna literature has revealed relations which completely describes the characteristics of the etched slot. The study will be continued to include other etched configurations while awaiting the receipt of the microwave test equipment essential to a more thorough investigation.

2510 - MINIATURE AUDIO OSCILLATOR (E/IN-1K)

Work has been initiated to accomplish the modifications revealed to be desirable during the initial evaluation of this unit. The feasibility of including a Veeder-Root Counter as a frequency indicator is now being studied. The results of this study will be discussed with the project liaison office in the near future.

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2511 - TRANSISTORIZED VIDEO AMPLIFIER (E/VA-3)

The engineering model of this unit has been forwarded for field evaluation.

2512 - TRANSISTORIZED RF CONVERTER (CV-1)

Twelve converters are being constructed for O&T. Three units are scheduled for delivery on 16 December with the remaining nine to follow by 9 January.

25X1A2g 2513 -

Attention is currently directed to the determination of the characteristics of possible RF component configurations. The antenna, filters, lines, and detector arrangements will be considered during this phase.

The transistorized video amplifier being developed under project 2511 will be used.

Two Minifon recorders, one 2½ hour capacity and one 5 hour capacity, have been ordered.

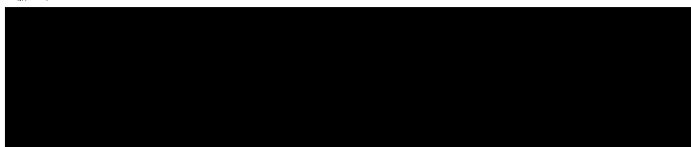
SPECIAL PROJECT - HELICAL ANTENNA CHARACTERISTICS

The results of measurements made on the helical antenna will be reported during the coming period.

2. ADMINISTRATIVE

TDY

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28 Oct. - 30 Nov.

14 Nov. - 18 Nov.

PCS

Not applicable

EOD

25X1A9a

clerk typist, entered on duty at the Laboratory  
12 December 1955

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electronics engineer, entered on duty 30 November 1955.

RESIGNATIONS

Not applicable